

## **TCO Comparison Between a Used Diesel and New Battery Electric Day Cab October 1, 2022**

The attached spreadsheet compares the Total Cost of Ownership (TCO) between purchasing a used diesel Class 8 Day Cab vs a new Class 8 battery electric Day Cab.

### **Key assumptions**

1. The TCO study begins in 2025
2. The TCO model is based on CARB's TCO tables and assumptions published on September 9, 2021 but assumptions have been updated based on new data from CARB's ISOR report released in August 2022 for vehicle costs, fuel economy, average unit fuel costs, LCFS credit /kWh and maintenance costs.
3. The used diesel truck is 10 years old and would cost \$34,572 (This is based on CARB's diesel residual cost table.) According to CARB's TCO study, a new diesel would cost \$145,689.
4. The used diesel is sold at 12 years.
5. CARB assumed a financing rate of 7% but assumed that less creditworthy purchasers would have to pay a rate of 15%. To be conservative, we doubled the proportionate financing cost to reflect a 14% rate.
6. We followed CARB's assumption that for day cabs, 75% of the charging occurs at depots and 25% at retail chargers.

### **Results**

<b>Total Cost of Ownership Comparison Between Used Diesel and Electric Day Cab</b>				
	<b>Used Diesel</b>	<b>Battery Electric</b>	<b>Savings</b>	<b>Savings %</b>
<b>TOTAL</b>	\$ 571,496	\$ 440,603	\$ 130,893	23%
Less Federal Tax Credit		\$ (40,000)		
<b>GRAND TOTAL - with Fed Credit</b>		\$ 400,603	\$ 170,893	30%
Less 33% of EVSE costs		\$ (60,929)		
<b>GRAND TOTAL - with Fed Credit and EVSE Savings</b>		\$ 339,674	\$ 231,822	41%

### **Conclusion**

Though counter intuitive, the TCO of a new battery electric class 8 day cab is significantly less costly than a used diesel costing \$35,000 vs a new electric truck costing \$205,000.

**The electric day cab will save \$170,893 or 30% over the TCO cost of the used diesel** when including the new \$40,000 Federal Tax Credit provided through the Inflation Reduction Act (IRA).

There are extensive and well-funded programs from utilities and state agencies to financially support charging infrastructure costs for medium and heavy-duty vehicles. In the ISOR, (page 34) CARB states, "The resulting programs developed by the electric utilities due to SB 350 from

CPUC Decisions of 2018 and 2019, for which \$740 million has been authorized, promote the deployment of medium- and heavy- duty ZEVs through incentivizing infrastructure upgrade projects that offset most or all the costs for electrical service upgrades.” There are many other well funded programs as well. However, CARB elected not to include any of these incentives in its TCO study. Therefore, we have conservatively estimated that these programs will cover at least 33% of the cost of charging infrastructure (aka EVSE or electric vehicle service equipment) for many years in the future. **When including this support for infrastructure, the electric day cab will save \$231,822 or 41% over the TCO cost of the used diesel.**

Additional key contributors to this lower TCO for the electric day cab are:

1. Fuel costs – the fuel cost for the used diesel is \$358,000 vs the electricity cost for the electric truck is \$192,000 for a 46% savings. The LCFS credits - \$261,000 – more than offset all of this cost with a net excess of \$69,000 that can be utilized to cover other costs.
2. Maintenance costs are \$119,000 for the diesel vs \$71,000 for the electric for a 40% savings.

**In conclusion**, we believe that small owner operators and small fleets that may be accustomed to only buying used diesel vehicles, may actually be better off buying new electric trucks and that the ACF rule instead of creating new financial obstacles for them will actually help lower their costs. In a few years, they can save further by buying used electric trucks as they become available.

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